

(No Model.)

J. BATLEY.
ELECTRIC MOTOR.

No. 264,848.

Patented Sept. 26, 1882.

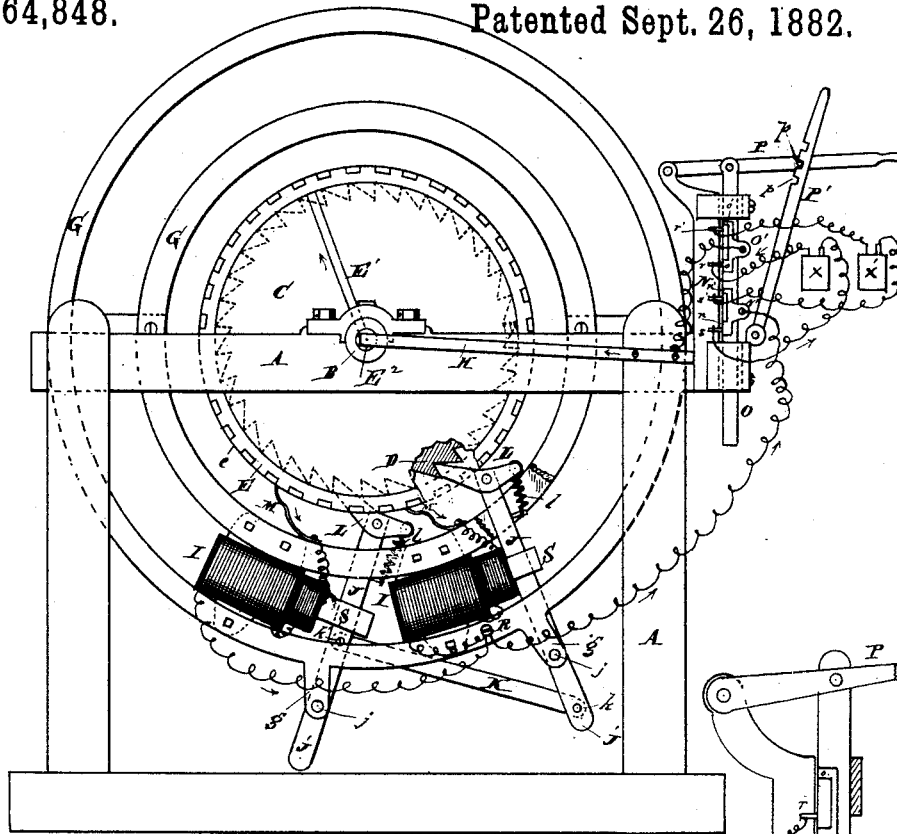


Fig. 1

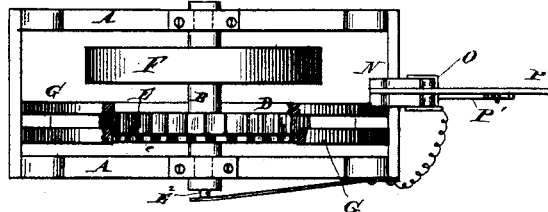


Fig. 2

Fig. 5

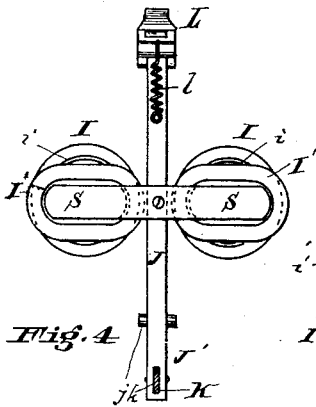


Fig. 4

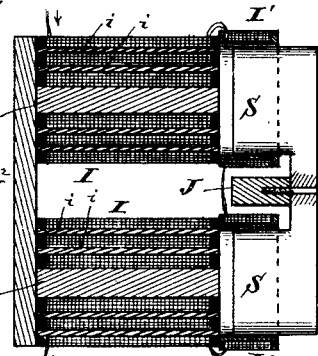


Fig. 3

Attests
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UNITED STATES PATENT OFFICE.

JOHN BATLEY, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 264,848, dated September 26, 1882.

Application filed February 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN BATLEY, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Electric Motors, of which the following is a specification.

The object of my invention is to construct an electro-magnetic motor wherein the direct attraction of the electro-magnets to the armatures is utilized (at a longer range than commonly) to multiply by induction the initial potential of the current and to make an engine of any desired horse-power, said power being adapted to be increased or diminished without altering the speed of the working parts, the mechanism of which is fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

In the drawings, Figure 1 is a side elevation of my improved motor with a small portion of the frame broken away. Fig. 2 is a plan of same with a portion of the frame broken away. Fig. 3 is a sectional plan through the magnets and armature. Fig. 4 is a front elevation of same detached from the machine; and Fig. 5 is an enlarged view of the starter, cut-off, and connection with the battery elements, (detached from the machine.)

A is the frame, and carries axle B, upon which is secured fly-wheel F, ratchet-wheel or its equivalent, D, and commutator E, which is electrically connected with the insulated stud E² on the axle B; or the axle itself may be properly insulated and take the place of said stud.

Encircling the wheel D are rings or frames G, which are secured fast to frame A, and really form part of same.

The electro-magnets I are supported and secured to the frame G and operate armatures S, secured to levers J, pivoted at *j* to extensions *g* from the frame of the machine, and provided at the tops with pawls L, adapted to engage with the teeth of the ratchet-wheel D, with which they are kept in contact by springs *l*. These levers J extend below the pivots *j*, as shown at J', and the bottom of the extension of one lever is pivoted at *k* with a lever-bar K, which is pivoted to the next lever at an equal distance above the pivot *j*, to the end that when one lever is drawn forward by its

magnet the other is moved back an equal distance. There may be any number of electro-magnets I and levers J arranged around the ratchet-wheel D; but I have only shown two, as my invention comprehends two or more; and, if desired, one or more ratchet-wheels D may be secured to the shaft B. These magnets are made with a central core, *i'*, and concentric tubular rings *i i*, the spaces between which and upon the outer rings are coiled with insulated wire, said coils being connected together in succession, one helix after another. These cores are joined together by a bar, *l*², in the usual manner. If desired, any other form of electro-magnet may be employed.

The armatures S are made oblong, as shown in Fig. 4, so as to take in part of all of the cores *i* and *i'*; and to give greater power and a longer throw to the armatures helices *l'* are made to encircle them, as shown, said helices being in circuit with magnets I, and to which they are secured.

The commutator E is provided with contact-pieces of sufficient length to give the required stroke to levers *j*, which is equal to one-half the pitch of the teeth of ratchet-wheel D, and the brushes M are made of springs secured to and insulated from the frame G, and press upon the commutator, so that one brush of a pair of magnets, as shown, makes contact before the other breaks contact, whereby the current is never broken, and the battery-circuit is always closed. The brushes are connected with the magnets I I', and are jointly connected to a pin, R, which is in circuit by a wire with the negative pole of the battery or current-generator. The stud E² is connected through spring H with the positive pole of the battery.

To put on instantly (and thereby start the motor) one or more currents from batteries I use the following device: An upright, N, is secured to frame A, and carries with it contact-pieces *s s'*, &c., *r r'*, &c., the pieces *s s'*, &c., being connected with one pole of a corresponding number of distinct elements, and pieces *r r'*, &c., with the other pole of said elements. In front of these pieces a rod or insulator-plate, O, is adapted to reciprocate by means of a lever, P, which may be set by a lever, P', with notches *p* in which a pin, *p'*, on lever P engages. To put on one or more ele-

ments, are plates N' and O' having respectively contact-surfaces *n n'*, &c., and *o o'*, &c. The surfaces *n'* and *o'* are double the width of *n* and *o*, and every additional element used requires an additional width of contact, as shown in Fig. 5, in which four elements are arranged to be placed in circuit with the machine. The plates N' and O' are respectively connected with stud R and spring H. In the position shown in Fig. 1 battery X is on the machine. Now, by pressing down the slide O the required distance (the next notch P) the contact-pieces *r' o'* and *s' n'* will come in circuit and put battery X' also to the machine. Any number of elements or batteries may be used by following the construction shown in Fig. 5, in which four elements are used. The electro-magnets I I' are arranged about the ratchet-wheel D, so that while one of the armatures is attracted and pulls the wheel the other is withdrawn, so that a series of continuous impulses is the result.

The operation is as follows: The current from one pole of the battery or batteries passes down spring H through stud E² to commutator E, thence through brushes M alternately to one pole of the magnets I I', the other pole being connected by stud R to the other pole of the battery or batteries, thus completing the circuit and working the motor. When a series of magnets are employed there will be one or more magnets pulling upon the ratchet-wheel through the agency of armatures and levers at the same time. It is obvious that by putting one or more distinct currents of electricity in circuit the power of the motor would be increased in the ratio of the number of elements or currents used, so that a governor could be arranged to regulate the power and speed and the different positions of the sliding piece O, thus regulating the force of current to the resistance.

It is not necessary to use a ratchet-wheel D, as any of the well-known friction devices may be substituted therefor, the pawl L being so arranged that it binds in one direction of movement of the armature S, but is free when moving in the other direction.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electro-magnetic motor, the ratchet-wheel D, or its equivalent, and commutator E, in connection with one pole of the battery or current-generator, in combination with brushes M, two or more electro-magnets, I I', arranged around the ratchet-wheel, levers J, carrying armatures S, and pawls L, and rod K, by which said levers are caused to move in opposite directions at the same time, said magnets I I' being in circuit with the brushes and the other

pole of the battery, substantially as and for the purpose specified.

2. The combination of ratchet-wheel D with commutator E, brushes M, levers J, carrying pawls L, armatures S, rod K, and electro-magnets I and I', substantially as and for the purpose specified.

3. The combination of two electro-magnets with cores *i'*, and concentric tubular rings or cores *i*, each wrapped with insulated wire, with levers, J, carrying the armatures S, and rod K, by which said levers are caused to move in opposite directions at the same time, as and for the purpose specified.

4. The combination of two electro-magnets, I I', levers J, carrying armatures S, and rods K, whereby said armatures are caused to move in opposite directions at the same time, substantially as described.

5. The combination, with an electric motor, of a current-regulating device which consists of rigid plates *s s'*, &c., in circuit with one pole of the batteries, and plates *r r'*, &c., with the other pole, a sliding piece, O, carrying plates N' O', which are respectively provided with a number of contact-pieces of different lengths, (shown in Fig. 5,) equal to the number of elements to be used, plate N', connected with the negative poles of the batteries through pieces *s s'*, &c., and plate O', with the positive poles through pieces *r r'*, &c., substantially as and for the purpose specified.

6. The commutator E, provided with contacts *e*, in combination with electro-magnets I I', levers J, bar or rod K, means to rotate said commutator by the vibration of levers J, and brushes M M, which are so arranged that one brush comes in contact with one of the contact-pieces *e* before the other brush leaves the contact-piece *e* upon which it is pressing, substantially as described.

7. The combination of ratchet-wheel D with commutator E, conductor E', stud E², spring H, brushes M, magnets I I', levers J, armatures S, pawls L, rod K, and mechanism to put on one or more batteries to the machine, substantially as and for the purpose specified.

8. The combination of the two electro-magnets I I', made of concentric cores and helices, as described, with pivoted levers J, provided with armatures S, rod K, shaft E, and connecting mechanism by which the vibrations of the armatures rotate said shaft, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

JOHN BATLEY.

Witnesses:

R. A. CAVIN,

R. S. CHILD, Jr.